2 Sheets—Sheet 1.

W. EPPELSHEIMER.

CLAMP FOR ENDLESS ROPE RAILWAYS.

No. 189,204. Patented April 3, 1877.

Fig. 1.

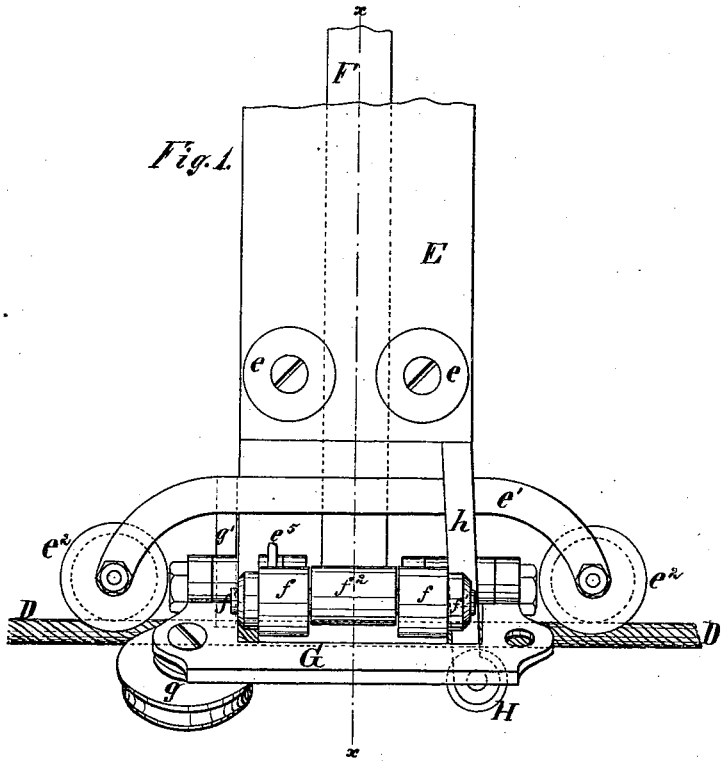


Fig. 2.

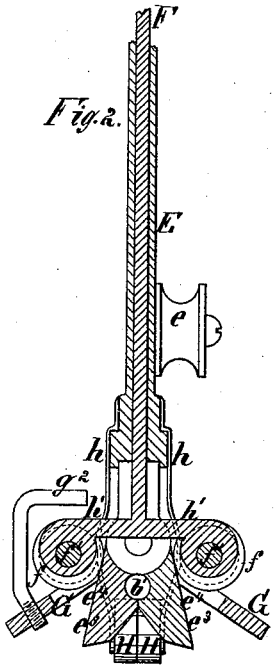
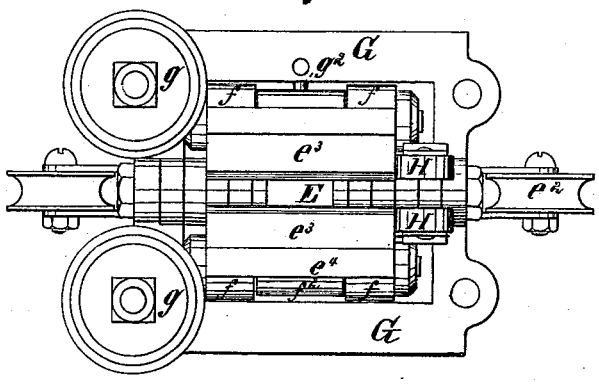


Fig. 3.



Witnesses:

Theodore L. Foster.

B. S. Clark.

Inventor:

William Eppelsheimer

By Joseph P. Tillet his Attys.

2 Sheets—Sheet 2.

W. EPPELSHEIMER.

CLAMP FOR ENDLESS ROPE RAILWAYS.

No. 189,204. Patented April 3, 1877.

Fig. 4.

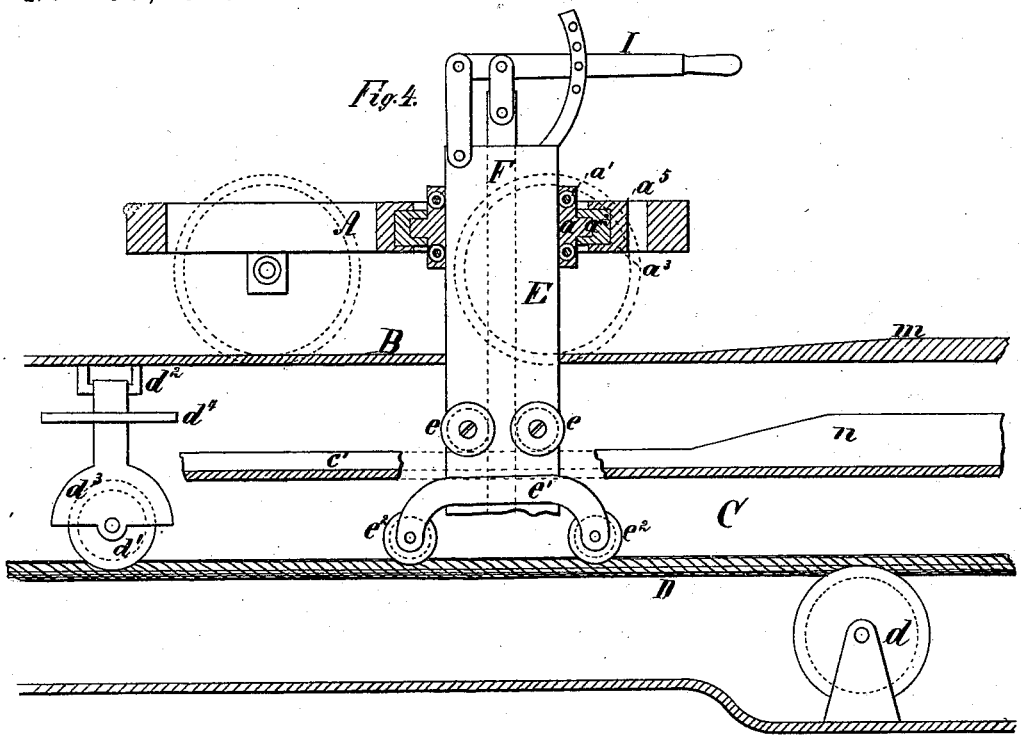


Fig. 5.

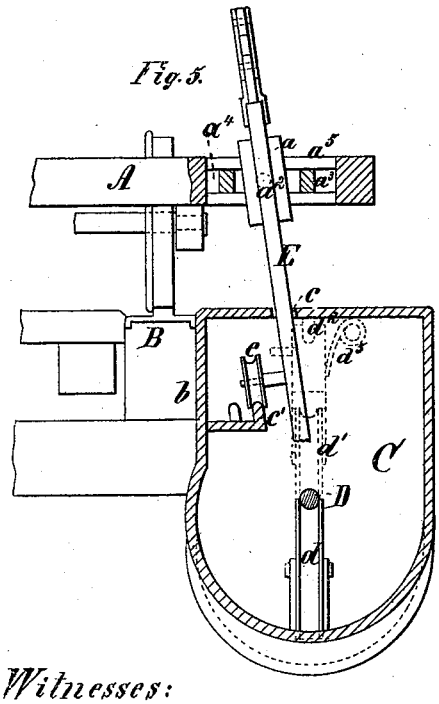
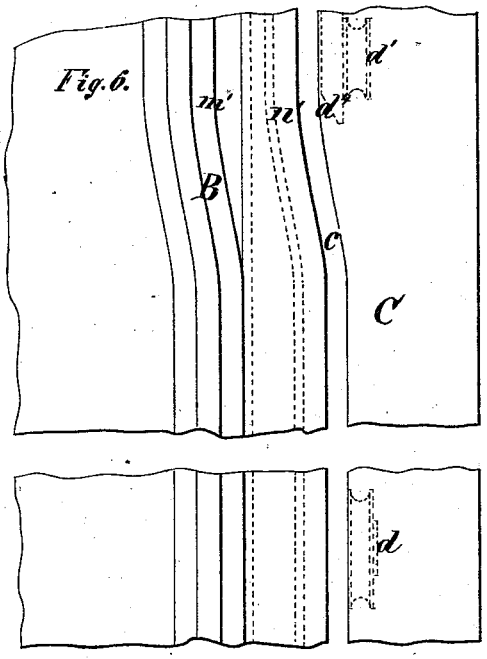


Fig. 6.



Witnesses:

Theodore L. Poster.

B. S. Clark

Inventor:

William Eppelsheimer,

By Joseph P. Fitch
his attn.

UNITED STATES PATENT OFFICE.

WILLIAM EPPELSHEIMER, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN CLAMPS FOR ENDLESS-ROPE RAILWAYS.

Specification forming part of Letters Patent No. **189,204**, dated April 3, 1877; application filed February 3, 1877.

To all whom it may concern:

Be it known that I, WILLIAM EPPELSHEIMER, of the city and county of San Francisco, in the State of California, have invented an Improved Clamp Apparatus for Tramways or Street-Railways, in which an endless cable is used as the motive power, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to the device employed to gripe and hold the rope, band, or other cable used in tramways or street-railways as the motive power for propelling the cars, said cable being placed in a tunnel or tube beneath the level of the road-bed; and where pulleys in the roof of said tube are necessarily employed, as in roads built over an uneven or undulating surface, to maintain the said cable in a proper position in the said tube, whereby I am enabled to arrange the rope or cable in the tunnel to one side of, and not directly beneath, or in line vertically with, the slot or opening in the roof of the tunnel through which the shank of the griping device enters the tunnel, thus protecting the cable from immediate contact with, and injury by, the dirt or water which may be admitted through said slot, while, at the same time, I do away with the employment of the heavy and expensive L-shaped griping device now in use in connection with the above-recited arrangement of parts; and my invention consists in the devices and combinations hereinafter described and claimed, whereby the advantages set forth are secured.

Figure 1 is a side elevation of my improved rope-griping device. Fig. 2 is a longitudinal central sectional view of the same on the line *x x*, Fig. 1. Fig. 3 is a lower end view of the same. Fig. 4 is a longitudinal sectional side view of a tunnel and road-bed, showing truck with my griping device attached, and its position on the cable in the tunnel. Fig. 5 is a vertical cross-section of the parts shown in Fig. 4. Fig. 6 is a plan view of the road-bed, showing the arrangement of the longitudinal slot in the roof of the tunnel.

A is the car or truck; B, the rails, and C the tunnel, in which is the endless cable D. This tunnel C I show at one side of the track, and this arrangement is preferable in adapting the system herein described to an ordinary tramway, as the tunnel may be laid without disturbing the rails or ties, while the string-piece *b* of one of the rails may be made to form part of the wall of the tunnel. In the floor or bottom of the tunnel are placed at suitable distances the cable-supporting pulleys *d*, over which the cable runs, while in the roof of the tunnel is formed the continuous opening or slot *c*, through which the griping device is entered, and at one side of this slot, over the line of the pulleys *d*, are fixed in the roof, and depending therefrom, the cable-pulleys d^1, under which the cable passes, being guided thereby. The cable is thus maintained at one side of the line of the slot *c*—that is, away from the vertical line of its opening. The upper pulleys d^1 are hung in hangers, which are hinged at d^2 to the roof, and are protected by a hood, d^3, while a bar, d^4, the ends of which are curved or rounded off, is fixed on the sides of the hangers, adjacent to the slot *c*, and projecting at right angles from that side. The hangers are held in position by the spring d^5. On the interior of the wall of the tunnel, adjacent to the road-bed, is arranged a projecting rail, *c'*, Figs. 4, 5, and 6. This rail may be continuous throughout the tunnel, or may be fixed to the tunnel-wall at the places where the pulleys *d* and d^1 occur in the tunnel, extending for a suitable distance beyond the places of the pulleys in both directions. This track is curved or carried away from the upper pulleys *d* wherever they occur, and is raised or curved upward at the places of the lower pulleys d^1.

The cable-griping device, which is only partly shown on Sheet 2 of the drawings, but which is plainly shown on Sheet 1, has a shank, E, which passes through the slot *c* of the tunnel, and extends upward to the truck, where it is arranged to slide up and down in a box, *a*, the said box having friction-rollers a^1 to facilitate this movement. The box *a* is pivoted at its ends at a^2 in a frame, a^3, which slides in ways a^4 formed in a main frame, a^5, the said main frame a^5 being formed as part of the truck-frame resting on the axles, and extending to one side of the truck over the line of the tunnel C. When the tunnel is ar-

ranged in the middle of the road-bed this frame a^5 may be dispensed with, and the shank-piece may be mounted, as described, in the frame of the truck. Upon the side of the shank E within the tunnel are mounted the wheels or rollers *e*, which run on the track or rail *c'*, while upon the lower end of the shank, mounted in a cross-frame, e^1, are the guide-pulleys or rollers e^2—one at each side, front and rear, resting on the cable D.

The cable griping device is constructed as follows: In an aperture extending longitudinally through the shank E is arranged the slide bar or rod F. Upon the lower end of the shank E are hinged the jaws e^3, between which, in suitable semicircular recesses or channels *b'* on their inner faces, the cable is grasped. The outer faces of these jaws are inclined outwardly from the hinge-joint to their lower edges, as shown at e^4, Fig. 3, and upon these faces are arranged to bear friction-rollers *f*, which are mounted on axles f^1 arranged above the jaws, and fixed in, and carried by, a cross-piece, f^2, which is fixed on the lower end of the slide F. e^5 is a pin set in one of the eye-pieces of the hinge-joint of the jaws, and projecting above one of the said friction-rollers *f*.

G G are frames hinged to the lower end of the shank E, and carrying upon one or both ends the guide-rollers *g*, each pair being arranged to engage between them the cable D, and to support it and guide it to the jaws e^3. These frames are pressed downward, and their rollers thus held upon the cable by a spring, g^1, while an angle arm or stud, g^2, fixed in one of them, as seen in Fig. 2, and extending up and over the cross-piece f^2 on the slide F, operates to swing the frame, and, consequently, to part the rollers *g* when the slide is raised and it is desired to disengage the griping device from the cable. Two half rollers, H, (carried by spring-arms *h*, which extend downward from the shank E and pass under the friction-rollers *f* carried by the slide F, and which said rollers are brought side by side to form one roller to support and guide the cable to the jaws e^3 by the downward movement of the slide, the rollers *f* pressing upon the curves *h'* in the arms *h*,) may be employed instead of the rollers *g*, or they may be employed at one end of the jaws in connection with a single pair of the rollers *g* in frames G, at the other end of the jaws, as shown in the drawings, Sheet 1. The rollers H are operated to release the cable when the griping device is disengaged therefrom by the raising of the slide F, when, the spring-arms *h* being relieved from pressure by the rollers *f*, the two half rollers will separate from each other, and the cable may pass between them. The slide and its shank-piece E may be conveniently raised or lowered by means of a lever, as shown at I, Figs. 4 and 5.

The operation of my invention is as follows: The shank E and the griping device carried by it being hung in its seat in the box *a* in the car-frame, as described, and being passed into the tunnel C, the shank extending through the slot *c* in the roof of said tunnel, as seen in Figs. 4 and 5, the shank may be tilted at an angle in its frame, so that the griping device may be brought over the line of the cable, as seen in Fig. 5. The shank is lowered until the rollers or pulleys e^2 rest upon the cable, and the rollers or wheels *e* rest on the track or rail *c'*. The slide F is now forced downward in the shank E, and, by means of the pressure of the rollers *f* on the outer faces of the jaws e^3, the jaws are closed upon the cable and gripe it tightly, while the rollers *g* or H support and guide the cable to the jaws. The truck or car is thus set in motion; and, as the griping device moves along with the cable it encounters in its progress the lower pulleys *d* and the upper pulleys d^1. Opposite to the lower pulleys *d* the rail *c'* is elevated or curved upward for a short distance, then returning to its former level, as shown at *n*, Fig. 4.

The rollers or wheels *e*, traveling on this rail, mount this curve or elevation, and carry the shank E upward in its seat in box *a*, thus lifting the jaws and other portions of the griping device away from and over the pulley *d*, the cable again dropping into its place on said pulley, when the rollers descend from the elevation, and the shank again passes downward in the slot *c*. To prevent a too violent raising of the shank in going over the elevation *n*, the rail of the track B may be also elevated or curved upward, as seen at *m*, Fig. 4, so that as the shank is raised in the box *a* the car or truck itself will also rise on the road-bed. This I do not, however, deem essentially necessary to the successful working of the invention. When the shank encounters the upper pulleys d^1 it strikes the bar d^4, and, by its contact therewith, swings the pulley away from the shank and griping device, while the rail *c'*, being curved away from the said pulley opposite thereto at *n'*, the shank is, by its rollers *e*, carried away from the pulley and the griping device and pulley thus escape each other. To obviate too violent an oscillation of the shank in its seat in the car-frame, by its being swung away by the engagement of the rollers *e* with the curve *n'* of the rail *c'*, the rails B of the road-bed may be curved away from or around the point where the pulley d^1 is situated in the tunnel, as at *m'*, thus carrying the truck or car away from the said pulley, and to that extent bringing the shank and griping device away from the said pulley, without said shank being so greatly swung or oscillated in its seat in its box *a* in the truck-frame. I do not, however, consider the curve *m'* in the rails B essential to the working of my invention, the interior rail *c'* and the bar d^4 being sufficient to accomplish the passage of the shank and griping device across the upper pulleys without contact between them. When it is desired to stop the car, the slide F is raised in the shank, when the jaws are re-

leased by the rollers *f*, and the pin e^5 being struck by the upper face of one of said rollers, the jaws are parted, and the cable released. The cable now plays along between the rollers *g* and over the rollers H, while the car may be brought to a stand-still. The slide being still further raised, the pulleys *g* are disengaged from the cable, and the rollers H separated, so that the cable may drop between them, when the shank may be raised, and the entire griping device brought above, and wholly disconnected from the cable.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a device for clamping a car to an endless traveling cable, the combination, with the shank E, carrying the clamping device, and having vertical movement and lateral oscillation in its seat or bearings in the car-truck, and provided with the wheels or pulleys *e*, of the rail *c'*, having curves *n'* and elevations *n*, as and for the purpose described.

2. The combination of the shank E, carrying the clamping device, and in which works the operating slide F, with the box *a* pivoted at a^2 in frame a^3, which slides in ways a^4 in truck-frame a^5, as described.

3. The combination, with the shank E, as described, of the hinged clamping jaws e^3, together with the operating slide F, its cross-bar f^2, and bearing-rollers *f*, as and for the purpose specified.

4. The combination, with the shank E, its hinged jaws e^3, and the operating slide F, carrying rollers *f*, of the hinged frames G, carrying guide-pulleys *g*, as and for the purpose specified.

5. The combination, with the shank E, jaws e^3, and slide F, with rollers *f*, of the spring-arms *h*, carrying the half pulleys H, as described, and for the purpose specified.

6. The combination, with the shank E, carrying the cable-griping devices, of the cross-piece e^1, carrying the front and rear upper guide-pulleys e^2, as described, and for the purpose specified.

7. The combination, with the hinged upper cable guide-pulley d^1, having hood d^2 and spring d^5, of the curved bar or plate d^4, arranged to operate as and for the purpose specified.

WILLIAM EPPELSHEIMER.

Witnesses:
J. C. CEBRIAN,
E. J. MOLERA.